DOCUMENT RESUME

ED 311 371 CG 021 986

AUTHOR Johnson, Jeannette L.; Bennett, Linda A.
TITLE School-Aged Children of Alcoholics: Theory and Research. Pamphlet Series.
INSTITUTION Rutgers, The State Univ., Piscataway, NJ. Center of Alcohol Studies.
PUB DATE 88
NOTE 30p.; For related documents, see CG 021 983-990.
AVAILABLE FROM Rutgers Center of Alcohol Studies, P.O. Box 969, Piscataway, NJ 08855-0969 ($2.50 + postage; quantity discount--inquire).
PUB TYPE Information Analyses (070)

EDRS PRICE MF01 Plus Postage. PC Not Available from EDRS.
DESCRIPTORS *Adolescents; *Alcoholism; *Children; *Drinking; *Etiology; High Risk Persons; Intervention; Prevention; Trend Analysis

ABSTRACT

Despite the research documenting the occurrence of alcoholism in families, little is known about how alcoholism is transmitted from one generation to the next or what causes several members of the same family to abuse alcohol. To date, the most consistent findings among school-aged children are reports of cognitive differences. Health problems, drinking-related traffic accidents, and negative socioeconomic consequences are the more visible adverse effects of alcohol abuse. Children of alcoholics have frequently been labeled as children at risk. These children are more likely to develop alcoholism or other behavior disorders than other children. Specific risk factors and protective factors for children growing up in alcoholic families have not yet been identified. While the literature on adult children of alcoholics is replete with anecdotes about the permeation of feelings of helplessness during childhood, the research on learned helplessness in children of alcoholics is sparse. Retrospective reports of adult alcoholics often indicate childhood problems with impulsive behavior. Other research has shown that alcoholism in the father represents a high psychopathic risk to the child's primary personality structure. No single biological marker distinguishing children of alcoholics from others has been found. Children of alcoholics have typically performed at lower cognitive levels than children of nonalcoholics. Given the state of research on school-aged children of alcoholics, it is safe to conclude that it is not known what causes alcoholism. (Resources for families of alcoholics are listed.) (ABL)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

About the Authors

Jeannette L. Johnson, Ph.D., is a Developmental Research Psychologist at the Addiction Research Center with the National Institute on Drug Abuse. She was formerly a research psychologist at the National Institute on Alcohol Abuse and Alcoholism.

Linda A. Bennett, Ph.D., is Associate Professor in the Department of Anthropology at Memphis State University. She also continues her collaboration at George Washington University Medical Center.

School-Aged Children of Alcoholics:

Theory and Research

by

Jeannette L. Johnson, Ph.D.

Linda A. Bennett, Ph.D.

Center of Alcohol Studies
Pamphlet Series

ERIC Full Text Provided by ERIC

© 1988 by Alcohol Research Documentation, Inc.
Center of Alcohol Studies, Rutgers University
New Brunswick, New Jersey

CONTENTS

School-Aged Children of Alcoholics: Theory and Research

INTRODUCTION

This pamphlet is the first of two which will review the theories and research about children of alcoholics. In this first one we describe some of the theoretical approaches and research findings from studies which compare school-aged children (between the ages of 5 and 18) of alcoholic and nonalcoholic parents. In the second pamphlet we will review the research on adult children of alcoholics.

In these pamphlets our goal is twofold. First, we will present selected research findings on offspring of alcoholics from a developmental perspective. With this perspective, we acknowledge that parenting by alcoholics has a differential effect on children of different ages. Second, because the study of children of alcoholics is in its infancy and many reports are likely to be forthcoming, we will present some guidelines and recommendations for reading and interpreting upcoming and published reports.

The Need for Research on School-Aged Children of Alcoholics

Despite the research documenting the occurrence of alcoholism in families, we know very little about how alcoholism is transmitted from one generation to the next or what causes several members of the same family to abuse alcohol. Some studies have shown that children of alcoholics perform less well on certain measures, such as cognitive or electrophysiological measures, and conclude that these differences may place children of alcoholics at increased risk for future problems in adulthood, especially alcoholism. To date, the most consistent findings among school-aged children are the reports of cognitive differences. However, no particular pattern of impairment has emerged which can distinguish those offspring who are at definite risk for alcoholism from those who are not. Moreoever, longitudinal studies which can tie these childhood differences with the occurrence of problems in adulthood, by measuring changes over several years rather than at one time only, remain to be completed.

Understanding how a child's early behavior contributes to alcoholism could aid our efforts to prevent alcohol abuse in several ways. First, we would be able to identify biological, psychological and environmental factors which predict later alcoholism. Second, knowing what patterns of interactions signal the onset of alcoholism could alert us to those offspring who would be most in need of intervention. And third, we might also be able to identify those people who are more likely to respond to treatment.

The main advantage in studying younger children of alcoholics, however, is to measure on-going behavior and thus avoid the errors of memories of childhood. Because research on young children of alcoholics is scarce, current descriptions of early home life are based on the memories of adults who have grown up in alcoholic families. These retrospective data are not necessarily the most reliable source of information on which to base theories of the transmission of alcoholism or to fund prevention projects which target school-aged children for intervention. With retrospective information, theories of the causes of alcoholism are inferred rather than based on direct observation. Recollective reports can be biased by: (1) the length of time between the incident and the report of it, since intervening experiences may color one's memory; (2) the age at which the incident occurred (i.e., age will influence it's interpretation); and (3) the current popular beliefs (e.g., media accounts) about such events. Studying younger children of alcoholics decreases many of these limitations (el Guebaly, 1986).

CONSEQUENCES OF ALCOHOL ABUSE

Alcoholism is a major social and medical problem affecting individual alcoholics and their families. Eighty-six percent of persons aged 12 and above reported alcohol use in the U.S. National Household Survey (1987). Ten percent of the adult population in the U.S.A. is alcoholic or has an alcohol-related problem (U.S. National Institute on Alcohol Abuse and Alcoholism, 1981). Health problems, drinking-related traffic accidents, and negative socioeconomic consequences are the more visible adverse effects of alcohol abuse.

In 1975, health costs for alcohol-related problems were in excess of 12% of total health expenditures, and the cost estimated of alcohol misuse and alcoholism was $43 billion. Excessive drinking impairs cognitive functioning (including attention, memory, information processing and social reasoning) and increases the likelihood of socially unacceptable behavior (Tarter, 1973). The chronic and prolonged use of alcohol can lead to liver cirrhosis, the seventh leading cause of death. Along with a host of other medical problems, alcoholism is associated with such brain diseases as Korsakoff's psychosis and alcoholic dementia.

Alcohol-related traffic accidents are especially tragic. These accidents constitute the major cause of violent death in our country, and more than 35% of all fatal traffic accidents and injuries are attributable to drinking. Drivers in the 16- to 24-year-old range represent 20% of licensed drivers but less than 20% of total miles driven, yet these young drivers account for 42% of all fatal alcohol-related crashes (U.S. Department of Transportation, 1982).

In addition, alcoholism and alcohol-related problems are often accompanied by negative socioeconomic consequences (such as financial distress and underemployment) and chronic family disruption that, in turn, result in problems among people close to the drinker.

The more insidious effects of alcohol abuse, however, are mostly invisible to the wider society. These are the effects of parental drinking within the privacy of the home, and its impact on the children. Children growing up in alcoholic homes have often been referred to as "forgotten" or as "neglected" (Bosma, 1972; Triplett and Arneson, 1978). Depending on factors such as the child's age, sex, and the family's socioeconomic status, parental alcohol abuse is often associated with any number of troubles, ranging from difficulties in school to more severe problems such as psychological dysfunction.

For the most part, personal anecdotes and clinical case reports provide the bulk of the evidence for identifying what happens to children of alcoholics. Accounts by adult children suggest that different children are affected by alcoholic parents in different ways. To begin with, the severity of the parent's drinking, the sex of the alcoholic parent, the sex of the child, and the child's age at the time the parent began abusing alcohol are often mentioned as important factors. In addition, other aspects of the parents' emotional functioning, the psychosocial characteristics of the family and the home environment often influence what happens to the children. The stability of family rituals (dinners, holidays, vacations, etc.) is found by research to be a protective factor among children of alcoholics in the transmission of alcoholism (Wolin et al., 1979).

While researchers have studied particular problems associated with alcoholism, such as marital conflict or tissue damage, we have only begun to assess the impact of alcoholism on their children. This is partly because children of alcoholics were a quiet group until recently. In most instances, children are physically and emotionally dependent on their parents and do not readily question their parents' authority, especially during early childhood. Several national organizations, however, have begun to speak for the children growing up in alcoholic homes. The National Association for Children of Alcoholics and the Children of Alcoholics Foundation, Inc., are among the most prominent. These organizations have played an important role in supporting research and increasing our understanding about children at risk for alcoholism.

THE CONCEPT OF RISK AMONG CHILDREN OF ALCOHOLICS

As children of alcoholics frequently have been labeled "children at risk," the concept of risk is central to understanding and interpreting the research about them. There are two important features to this concept: (1) risk for alcoholism, and (2) risk versus protective factors.

Risk for Alcoholism

There are an estimated 28.6 million children of parents with alcohol problems in the U.S., 6.6 million of whom are under the age of 18 (Russell et al., 1985). Studies of the children of alcoholics indicate that they are more likely to develop alcoholism or a range of other serious behavior disorders than the children of nonalcoholics.

In the early 1970s a series of adoption, twin and family studies compared offspring of alcoholics and nonalcoholics and examined the relationship between the incidence of alcoholism in adulthood and the alcoholism among their biological or adoptive parents (Kaij, 1960; Cloninger et al., 1981; Goodwin et al., 1973). These studies reported that children of alcoholic parents had a higher incidence of alcoholism even when they were raised in nonalcoholic adoptive homes. From these reports, as well as Nancy Cotton's (1979) review of 39 studies of alcoholics, it is generally concluded that children of alcoholic parents are at increased risk for alcoholism. It has been estimated that the sons of alcoholics have a four times greater risk of developing alcoholism when compared to the sons of nonalcoholics, and the daughters of alcoholics are twice as likely to develop alcoholism compared to the daughters of nonalcoholics (Russell et al., 1985). It is important to remember, however, that while no one is predestined to become an alcoholic, genetic factors may serve to increase or decrease the level of vulnerability toward alcoholism (Schuckit, 1985).

From another perspective, children of alcoholics can also be considered at risk because of their environment. These children are in continual contact with their alcoholic parent, hypothetically leading to increased exposure to deviant thinking and behavior, marital conflict, abusive communications, and repeated hospitalization. Living with these events can result in an increased likelihood of developing a variety of psychosocial and psychopathological disorders, including alcoholism (Martin, 1981).

Risk versus Protective Factors

We define risk and protective factors as those environmental or genetic agents which increase or decrease the possibility of harm in the individual.

Risk factors increase the likelihood of future maladaption. Sources of risk range from the presence of certain physical or psychological features in the family background (such as alcoholism or schizophrenia) to characteristics of the physical environment (such as malnutrition). Risk may show as slow psychological development or as dysfunctional social behavior (e.g., failing to cope successfully with peers one's own age). Thus, risk factors can be environmental (e.g., peer influences) as well as biological (e.g., early or late timing of puberty).

Protective factors increase the likelihood of positive adaptation and do not lead to the expression of disorders. An example of a possible protective factor against the development of alcoholism might be a positive nonalcoholic role model during a child's life.

Any factor can be considered a risk or as protective depending on its interaction with other factors. For example, in the social arena, traits that are usually considered risk factors are those that render the child unpleasant, difficult or aggressive. Social skills usually considered to be protective are those that lead the child to be friendly, well-liked, and socially adept and independent. An example of a biological risk factor is precocious puberty, which would place a mature-looking yet socially inexperienced youngster with an older peer group, exposing the child to experiences beyond the appropriate developmental period. Conversely, a timely staging of puberty with psychosocial skill attainment could be considered more protective since the child would be learning appropriate social behaviors during the appropriate developmental period. Unfortunately, at this time we have not advanced very far in our documentation of specific risk or protective factors for children growing up in alcoholic families. There are some promising leads, however, which will be discussed in a later section.

STUDYING CHILDREN OF ALCOHOLICS: DEVELOPMENTAL ISSUES

Whether they grow up in alcoholic or nonalcoholic homes, children face the challenges of each developmental stage with whatever resources they inherit, the ones provided by their environment, and the ones they intentionally or unintentionally develop themselves. As these resources interact during maturation, normal developmental changes occur in virtually every behavior, whether it is learning social customs or understanding math. Furthermore, within an individual child changes in one area may not always be consistent with those in others, so that, for example, biological development may be more advanced than social development.

Expressions of behavior at early stages of development can be expected to influence expressions of behavior at later stages, even as the latter are being shaped by new experiences or genes. For example, gregarious and socially skillful children are very likely to continue to be socially active adolescents. Since alcohol consumption by adolescents is likely to occur in peer groups, social competence during adolescence may serve as either a risk or protective factor for alcohol abuse depending on the peer group and on the physiological maturity of the child (either slow, precocious or normal).

Furthermore, children do not simply learn *more* as they grow, they learn *differently* at different ages. Developmental change is a dynamic process, both quantitatively and qualitatively. When learning is quantitative, it becomes additive: as children mature, they learn more. The qualitative process inherent in development, however, is expressed by how children learn. Depending on the stage of cognitive development, children learn about themselves and their environment in uniquely different ways. This quantitative and qualitative nature of development has important implications for treatment professionals and researchers. Treatment professionals must use different techniques with children at different developmental stages. Treating emotional problems in 5-year-olds requires different therapies from those used with 15-year-olds. Researchers must also use different assessment techniques: measuring self-esteem in 5-year-olds requires different tests than the ones used with 15-year-olds, if only because there are vast age differences in language.

RESEARCH FINDINGS ON SCHOOL-AGED CHILDREN OF ALCOHOLICS

Acknowledging that our understanding about specific risk and protective factors for children of alcoholics is imperfect, the following section presents some limitations to the current research. In the second section an overview of selected research findings is presented.

Methodological Limitations to Existing Data

While many studies are useful in examining differences between groups of children of alcoholics and children of nonalcoholics, important methodological issues should be considered in interpreting their results.

1. Most studies are not solidly based on a theoretical model of the developmental sequence of the transmission of alcoholism. While deficits may be revealed among children of alcoholics, such findings do not necessarily support or disprove a theory of the etiology of alcoholism.

2. Behavior is frequently determined by multiple factors. However, many studies only examine a particular behavior and do not take into account the fact that there are many measures of behavior. Studying just one behavior does not tell us anything about its relation to other behaviors and leads to oversimplified reasoning about causes and effects.

3. Similarly, the range of tests used for assessment is frequently very restricted; thus, it is difficult to get a full picture of potential deficits as well as an over-all profile of strengths and weaknesses.

4. Biased samples of children of alcoholics are often studied. For example, a large proportion of studies have examined groups of juvenile offenders or children referred to guidance centers and the findings reflect the fact that the children are in treatment or in trouble. Studies of large samples of children of alcoholics before they act out or are diagnosed with psychological problems are necessary to discover how they reach a particular diagnostic state.

5. Additionally, many studies do not have a matched control group of children. Thus, it is difficult to generalize from these samples to nontreatment populations.

6. Very frequently normal developmental differences and predicted changes in children's performance over time are ignored. Thus, subjects of wide age ranges and differing maturational or cognitive stages are lumped into a single group.

7. Most studies are not longitudinal; that is, they examine behavior at one point in time for "marker" status or rely on retrospective data to infer causal chains. In other words, are we seeing "true" deficits, or developmental delay?

8. An adequate assessment of psychosocial and cognitive risk requires that all children in a family be tested. Even when this is accomplished, studies rarely take into account the special problems encountered in analyzing the results, because children from the same family may be influenced by the same factors.

9. Frequently the severity of parental alcoholism is not differentiated. Alcoholic drinking varies from parent to parent and may have some effect on childhood behavior. Instead, children are grouped together whose parents have different patterns of alcoholism and behaviors.

10. The focus of most of the research has been on the children of alcoholic fathers. Aside from the fetal alcohol syndrome (reviewed by Poskitt, 1984, and Streissguth, 1983), we know very little about the role of maternal alcoholism in the development of alcoholism in the children.

11. More importantly, many studies focus on deficits or risk factors, and not on protective factors associated with alcoholism. Studies of competence among children of alcoholics would enable us to understand the role of protective factors in the development of adaptive behavior among children of alcoholics.

Review of Selected Research

Clinical and experimental observations have shown many differences between children who come from alcoholic and nonalcoholic families. Studies looking for risk factors of alcoholism in the offspring of alcoholics can be divided into two types: assessment of the family environment, and assessment of deficits. In this pamphlet we will focus primarily on deficit studies.

Familial studies frequently examine children of alcoholics from a family illness perspective. Living with an alcoholic is indeed a family affair, and the constant stress and fears of various kinds are often referred to as a "family illness." These studies often suggest that not only are alcoholic parents intricately involved in alcoholism, but that the entire family is part of a system that affects the course and consequences of the alcoholism, as well as the functioning of all family members (Jacob et al., 1983; Steinglass, 1980). Discord and disruption are typically found in families of alcoholics, yet not all members of the same family are affected in a similar manner. Divorce, remarriage, and cohabitation rearrange families into various forms of biologic and environmental heterogeneity (Steinglass et al., 1987).

Deficit studies typically hypothesize that children of alcoholics perform less well in certain areas such as academic or behavioral performance. Several reviews report a summary of research findings on children of alcoholics (el Guebaly and Offord, 1977, 1979; Russell et al., 1985; West and Prinz, 1987). Because the factors that predict alcoholism are complicated, it is useful to group them, but with the understanding that behavior is multiply determined, rarely exists without interacting with other behaviors, and changes over time. In this pamphlet we briefly review four areas of research relevant to educators, parents, and therapists: emotional problems, behavioral adjustment, electrophysiology, and cognition. Because the most consistently reported differences between children of alcoholic and nonalcoholic families occur in the cognitive domain, this area is given somewhat greater emphasis.

Emotional Problems. Emotional problems in children can be generally defined as those emotional responses which go beyond the range of behavior normally expected for the particular developmental stage. Assessing emotional problems during development is difficult for the very reason that developmental inquiry is especially interesting: children change quickly, at variable rates, and move in qualitatively different ways from stage to stage. The years between 5 and 18 are a time of rapid emotional change, with some stages of development, such as puberty, moving more rapidly than others. What is normal at one age may not be normal at another. Tests used to measure emotion at one age may not be appropriate measures at another age.

At different ages the same emotional problem can result in different behaviors. Depressive symptoms in children may sometimes mimic adult depression, that is, with a sad and internalizing style, but some depressed children may display aggressive, externalizing behavior. Aggressive behavior in very young children may mask an underlying depressive affect. For these reasons, we have only recently begun to understand the emotional development of children in a few areas. There is still much that remains unknown about normal emotional development, let alone understanding that which goes beyond the range of normal development.

Many different types of emotional problems familiar to adults can develop during childhood. These problems range from affective disorders, such as depression and anxiety, to more severe problems, such as schizophrenia or obsessive-compulsive disorder. To date, the more severe emotional problems in children who come from alcoholic homes have not been adequately studied, and the few available studies primarily assess depression, anxiety, and personality disorder. For example, Moos and Billings (1982) found significant differences in problems among children from 23 relapsed alcoholic families, compared with children from 28 recovered alcoholic families and 59 matched community control families. In this study, the Health and Daily Living Form was completed by the mothers regarding their children's functioning: while no significant differences were found for serious mental or physical problems, the authors suggest that when parents controlled their alcohol problem, the children's stress related to the alcoholism diminished.

Emotional development frequently interacts with other behavioral domains, especially cognition. For example, under the age of seven, children cannot easily empathize with situations other than their own. Empathy — the ability to perceive and understand the mood and feelings of another person — develops hand-in-hand with a cognitive structure referred to as "reversibility," which allows the child to take a perspective other than their own. As children grow

they are able to increasingly experience certain kinds of emotional flexibility. Empathy develops gradually and by the age of seven or so the phrase "How would you feel if you were Jan (or Jim)?" has cognitive meaning, and thus emotional meaning with implications for more mature social relationships.

The relationship between emotions and self-esteem is also very important. While there is no one generally acceptable definition, simple definitions of self-esteem refer to the effect that self-perception has on emotions and behavior. Studies of individuals who perceive themselves as competent indicate that they have been effective in changing and controlling their environment and thus have learned that the consequences of their action are related to their behavior. On the other hand, feelings of incompetence stem from the perceived inability to change and control situations in the environment. Therefore, one learns that consequences are unrelated to behavior. Even infants have been found to be more responsive when they have been able to effectively control certain situations, such as the turning of mobiles. If one has learned that they are ineffective in making changes, that their behavior does not affect outcome, it is equivalent to learning that one is powerless, or helpless. Learned helplessness, often linked to depressive affect, therefore becomes the way new experiences and situations are faced (Seligman, 1975). Rolf et al. (in press) have just recently reported that children of alcoholics show more depressive affect than children of nonalcoholics. Children of alcoholics were more frequently on the extreme end of a scale which measured self-reports of depression.

While the literature on adult children of alcoholics is replete with anecdotes about the permeation of feelings of helplessness during childhood, research on learned helplessness in children of alcoholics is surprisingly sparse. We can only extrapolate from a few studies. Prewett et al. (1981) have reported that children (aged 7 to 12) from homes having a severe drinking problem had higher externality scores on a measure of locus of control. (High externality scores are associated with a concept referred to as response independence, which is similar to learned helplessness.) Response independence implies that an individual attributes behavior to external rather than internal causes, suggesting that the individual has learned that what happens is not related to his or her behavior. Perhaps children of alcoholics have learned at a very early age that responses to their behavior are independent of their action, thus the development of learned helplessness begins.

Three research reports focus solely on self-esteem. Dissertation research by O'Gorman (1975) and Baraga (1977) shows that children of alcoholics report lower self-concepts than those of nonalcoholics. O'Gorman compared three groups of 12- to 18-year olds (29 from ac-

tive alcoholic families, 23 from recovering alcoholic families, and 27 from nonalcoholic homes), and found that those children from active or recovering alcoholic families had lower self-esteem scores than children from nonalcoholic homes. In alcoholic families, social support also plays a role in self-esteem. Hughes (1977) found lowered self-esteem in children of alcoholics who did not attend Alateen when he compared them with children of alcoholics who attended Alateen. Without further research, however, the impact of the relationship of self-esteem on emotional development remains vague.

Behavioral Adjustment. Retrospective reports of adult alcoholics often indicate childhood problems with impulsive behavior (Morrison and Stewart, 1971). Alterman et al. (1982) found that alcoholics who said they were hyperactive as children also reported that they were less able to control their impulses to consume alcohol during adulthood. Other investigators report a higher incidence of alcoholism in the parents of hyperactive children (Cantwell, 1972). Such results have led some researchers to conclude that hyperactivity, which includes many behaviors clustering around attentional disorders and impulse control, precedes the onset of alcoholism.

The relevance of impulsivity to behavior problems has been demonstrated with hyperactivity, juvenile delinquency, and alcoholism. Some researchers have hypothesized that a history of hyperactivity might be a predisposing factor to a more severe type of alcoholism (de Obaldia et al., 1983). Blouin et al. (1978), for example, found that teenagers with a history of hyperactivity drank distilled spirits more often than teenagers without a history of hyperactivity. Many reports are retrospective ratings, however, and the evidence demonstrating clearly that non-delinquent school-aged children show concurrent behavior problems or impulsive behavior is very limited. A few studies suggest that certain aspects of impulsive behavior may be present in children of alcoholics during childhood, and not necessarily only in adulthood. In one study by Bell and Cohen (1981), children of nonalcoholic mothers were rated by their teachers as being generally less over-reactive in their school behavior, when compared with the ratings of 24 children of alcoholic mothers. Others have reported (McCord and McCord, 1960, 1962) that preadolescents who later became alcoholic were outwardly self-confident, emphasized their independence, and showed unrestrained aggression. Clearly, many more studies of current childhood impulsive behavior are necessary before we can conclude that children of alcoholics are impulsive. In fact, there may be only a subgroup of these children who are truly impulsive responders.

Other studies look for personality disorders in children of alcoholics with some consensus that alcoholism in the father represents a high psychopathic risk to the child's primary personality structure. In a

study of personality in sons of alcoholic fathers, Tarter and his colleagues (1984) used the Minnesota Multiphasic Personality Inventory, a 350-item test which measures different dimensions of personality. They found that the boys with alcoholic fathers scored higher on the hysteria, hypochondriasis, depression, and lie scales and concluded that these children showed a tendency for increased psychopathology, but were not severely pathological. In another study, Steinhausen et al. (1984) compared four groups of children: 39 with alcoholic fathers, 15 with alcoholic mothers, 27 with both parents alcoholic, and 43 with nonalcoholic parents. When they were rated by clinicians or parents, those children who were born to one or both alcoholic parents more often showed signs of psychiatric problems: children of alcoholic fathers exhibited more conduct disorders, and children of alcoholic mothers more emotional problems. Similarly, Herjanic et al. (1977) found significant differences between 82 children of alcoholics and 67 children of nonalcoholics (all of whom had been referred to a pediatric clinic) when they were tested for psychiatric disorders and behavior problems: relatively more deviant behaviors and a greater tendency to be diagnosed as having a psychiatric disorder (especially conduct disorder) was found among the 12- to 18-year-old children of alcoholics.

Research is required which assesses children of alcoholics who are not delinquent or psychopathological in order to better understand the relationship between general behavior and the risk for alcoholism.

Electrophysiology. The higher incidence of alcoholism among the offspring of alcoholics has generated much interest in the identification of some biological factor which might indicate a risk for alcoholism. Isolating biological mechanisms has involved various research techniques using neuropsychological, cognitive and endocrinological functioning. While the majority of studies report findings which distinguish children of alcoholics from the children of nonalcoholics, no single biological marker has yet been identified.

Studies of specific brain responses have been the most promising. Many of these studies have examined event-related potentials (ERP), which are brain responses evoked by different types of stimulation, such as by sight or sound. The amplitude or latency of the ERP wave is then measured. One important measure of the ERP is the P3 component, a positive peak often referred to as an index of cognitive processing.

In some studies, P3 amplitudes of the auditory ERP have differed between offspring with a positive family history of alcoholism and those without a positive family history (Begleiter et al., 1986; Elmasian et al., 1982); however, these findings are not reported consistently in all such research (Baribeau et al., 1986). One study of visual

ERP using a visual rotation method reported decreased P3 amplitudes in 7- to 13-year-old sons of alcoholic fathers (Begleiter et al., 1984).

Methodological differences in ERP studies make between-study comparisons difficult. While the P3 component in children of alcoholics may be different from the P3 component in children of nonalcoholics, the meaning of the difference and its relationship to problems later in life remains unclear. Nevertheless, the ERP is a noninvasive measure which may eventually lead to identifying a biological marker for alcoholism.

Cognition. Cognitive and attentional processes have been examined by many researchers looking for risk factors because: (1) they are fundamental to human adaptation at all stages of development; (2) they can be measured uniformly across developmental stages; (3) they may show sufficient continuity to be measurable as predictive traits; and (4) they are often associated with the signs and symptoms of alcoholism. It has also been suggested that impaired cognitive capacities may exist in individuals before the onset of alcohol abuse (Tarter and Edwards, 1986). Most neuropsychological deficits occurred in "primary" alcoholics (those whose main problem was drinking and not an emotional problem) and some of these deficits may be present premorbidly (de Obaldia et al., 1983). Adults with a positive family history of alcoholism show relatively lowered cognitive functioning (Schaeffer et al., 1984).

On the basis of such findings, recent studies have compared differences in cognitive performance between children of alcoholic and nonalcoholic parents. Using a wide variety of tests, these studies have typically concluded that children of alcoholics perform at lower cognitive levels than children of nonalcoholics (Chart 1). When Ervin and her colleagues (1984) compared 41 children raised by alcoholic fathers with 41 children raised by nonalcoholic fathers, they found that among the children of alcoholics the IQ was within normal range but that their scores on the Full Scale IQ were significantly lower than those of the children of nonalcoholics. Similar findings were reported by Gabrielli and Mednick (1983), who compared 27 children of alcoholic fathers with 114 children of parents evidencing no alcohol problems. Despite IQ scores that were within normal range, children of alcoholics performed less well on WISC-R Full Scale and Verbal IQ, but not on Performance IQ. Not all cognitive findings with children of alcoholics consistently show differences. For example, Tarter et al.'s study (1984) of 16 delinquent adolescent sons of alcoholics and 25 delinquent adolescent sons of nonalcoholic fathers did not differ significantly on Full Scale IQ. Out of 47 total test and sub-test scores from three cognitive measures, only eight results were lower for children of alcoholics. On Full Scale IQ, the

CHART 1 — Cognitive Studies with Children of Alcoholics

Authors	Sample Characteristics	Measures	Results
Tarter et al. (1984)	16 sons of alcoholic fathers compared with 25 sons of nonalcoholic fathers. (Average age = 16 years.)	WISC[1]/WAIS[2] (all subtests) PIAT[3] (6 subtests) Detroit Test of Learning Aptitude (6 subtests) Pittsburg Initial Neuropsychological Test System (23 tests: verbal intelligence, attention and concentration, learning and memory, perceptual-motor, Reitan aphasia error score) Childhood History Checklist Matching Figures Test MMPI[4]	Sons of alcoholics performed worse on: 1. PIAT Reading Comp. 2. Detroit Auditory Attn. Span 3. Detroit Visual Attn. Span 4. Verbal Intelligence-Peabody Picture Vocab. Test 5. Wechsler Memory Scale: Immediate Recall 6. Wechsler Memory Scale: Delayed Recall 7. Spatial-Trailmaking A and B 8. Reitan Aphasia Error 9. MFFT — longer latency to first response and to correct response 10. Higher MMPI scores on Hysteria, Hypochondrias, Depression, Lie Scales
Ervin et al. (1984)	50 boys and girls of alcoholic fathers and nonalcoholic mothers compared with 50 boys and girls of nonalcoholic parents. (Age: 6% under 3, 66% aged 3-14, 28% aged 15 and older, compared with 10% under age 3, 74% aged 3-14, and 16% aged 15 and older.)	WISC/WAIS (all subtests) WRAT[5] (Reading, Spelling, Arithmetic)	Children of alcoholics performed worse on: 1. Full Scale IQ 2. Performance IQ: Picture Completion Picture Arrangement 3. Verbal IQ: Information Arithmetic Similarities Vocabulary 4. WRAT Reading, Spelling, Arithmetic

Authors	Sample Characteristics	Measures	Results
Gabrielli and Mednick (1983)	Low-risk group: 114 boys and girls of nonalcoholic parents. Moderate-risk group: 43 boys and girls of "problem drinker parents" of whom 9 were schizophrenic and 13 were psychopathic fathers or character disorder mothers. High-risk group: 27 boys and girls of first or second degree alcoholics, 5 of whom were schizophrenic and 19 were psychopathic fathers or character disorder mothers. (Age = 11 to 13 years.)	WISC subtests: Vocabulary Similarities Block Design Object Assembly Maze	High-risk children performed worse on: 1. Similarities 2. Vocabulary 3. Verbal IQ 4. Total IQ
Noll and Zucker (1983)	10 boys of alcoholic fathers compared to 10 boys of nonalcoholic fathers; no maternal alcoholism. (Average age = 4 years.)	Yale Developmental Inventory. Fine Motor Adaptive Language Personal/Social Function Gross Motor Development Concept Formation of Alcoholic Beverages	Children of alcoholics performed worse on: 1. Fine Motor 2. Adaptive 3. Language 4. Personal/Social Dev. 5. Concept Formation
Drejer et al. (1985)	134 sons of alcoholic fathers compared to 70 sons of nonalcoholic fathers. (Average age = 19 years.)	Handedness Block Design Visual Gestalt Digit Span Serial Subtraction Picture Recognition Halstead Category Test Memory-Paired Associates Vocabulary Porteus Maze Word Fluency Embedded Figures	Children of alcoholics performed worse on: 1. Vocabulary 2. Halstead Errors 3. Porteus Maze Errors

(Chart continued next page.)

Authors	Sample Characteristics	Measures	Results
Hegedus et. al (1984)	16 delinquent sons of alcoholic fathers compared witn 25 delinquent sons of nonalcoholic fathers. (Age = 16 years.)	WISC-R PIAT Family Environment Scale MMPI Devereux Adolescent Behavior Scale	Sons of alcoholics performed worse on: PIAT Grade Levels: Reading Recognition General Information Total Test Score
Marcus (1986)	15 boys and 25 girls of alcoholic mothers compared to 20 boys and 20 girls of nonalcoholic mothers. (Age = 7 to 13 years.)	PIAT subtests: Math Reading Recognition Reading Comprehension Spelling General Information Total Score	Children of alcoholics performed worse on: Math Reading Recognition Reading Comprehension Total Test
Knop et al. (1985)	70 sons of nonalcoholic fathers compared to 134 sons of alcoholic fathers. (Age = 19 to 20 years.)	Interview Teacher questionnaire	Children of alcoholics were highest in impulsive-restlessness; lowest in verbal proficiency.

[1]Wechsler Intelligence Scale for Children.
[2]Wechsler Adult Intelligence Scale.
[3]Peabody Individual Achievement Test.
[4]Minnesota Multiphasic Personality Inventory.
[5]Wide Range Achievement Test.

adolescent boys in both samples tested in the low normal range. Because these studies use a variety of methods, no single pattern of cognitive deficits has been found to definitely signal risk for alcoholism.

Moreover, without a longitudinal perspective, it is difficult to know whether any of these childhood differences will eventually have an impact on development in adulthood. Very few longitudinal studies have examined cognitive differences in children of alcoholics. In an overview of 80 alcohol-related longitudinal studies, Fillmore (1985) found three completed studies of young children of alcoholics and four others which await completion. Werner (1986) recently reported on the results of a longitudinal study in which a subgroup of children of alcoholics with and without problems (defined as repeated or serious delinquencies or mental health problems requiring treatment) had been followed from birth to age 18. Those 18-year-old children of alcoholics with problems were primarily males who scored significantly lower on verbal and quantitative cognitive measures than the children of alcoholics without problems. These findings suggest that cognitive deficits may not characterize children of alcoholics as a group, but might primarily characterize children of alcoholics who express maladaptive behavior at a later age.

Many authors have hypothesized reasons for these observed differences. Some attribute them to family experience, socialization and maternal responsivity (Noll and Zucker, 1983). Along these lines, Werner (1986) suggests that the risks of being a child of an alcoholic can be buffered by the constitutional characteristics of the child and by the qualities of early caregiving.

CONCLUSIONS

Because many behaviors exhibited by children of alcoholics are assessed with the expectation that such behaviors constitute a risk factor and may be reliable markers for the eventual expression of alcoholism, researchers often prematurely state that specific differences between children of alcoholics and nonalcoholics are reliable predictors. Given the current state of research on school-aged children of alcoholics, it is safe to conclude that we do not know what causes alcoholism. Separating causal from correlational relationships in the search for predictive markers requires carefully designed longitudinal studies with varied samples of children at risk. Risk status depends on whether the father or the mother (or both) is an alcoholic, how long the parent has had alcohol problems, and at what age in the child's life the parent became alcoholic.

In similar studies of schizophrenia and depression, the etiological paths to adult forms of the disorders are found to be very hetero-

geneous (Watt et al., 1984). There is a growing consensus that the emergence and duration of childhood markers for adult schizophrenia and depressive disorders vary a great deal and are the result of genetically determined individual differences in development interacting with variations in family, peer, and macro-environmental contexts. Thus researchers examine a wide variety of potential markers which would be either characteristic of the adult disorder (e.g., thought disorder in schizophrenia), or related to the adult disorder (e.g., cognitive deficits in alcoholism), or researchers seek highly generalizable risk markers in psychobiologic processes which are fundamental to human adaptation.

It is probable that there are many paths along which biological and social variables alternate as primary or secondary causal agents for alcoholism. Because alcoholism is most likely to be determined by several influences, identification of risk and protective factors for children of alcoholics requires a broad assessment of children at different ages. Such assessments ideally include family environment measures (e.g., family alcohol use and the maintenance of family traditions) and individual processes (e.g., psychological structures, temperament, and physiology).

We would like to restate that the research on children of alcoholics is still in its infancy. Many promising studies indicate that there are a wide variety of differences between children of alcoholics and children of nonalcoholics occurring at all ages. Given time and an adequate number of studies, research will eventually synthesize a testable, replicable hypothesis. Until such a time that research findings advance, it would be unfair to generalize to all children who grow up in alcoholic homes.

BIBLIOGRAPHY

Alterman, A.I., Petrarulo, E., Tarter, R. and McGowan, J.R. Hyperactivity and alcoholism: familial and behavioral correlates. *Addict. Behav.*, Oxford 7: 413-421, 1982.

Baraga, D.J. *Self-Concept in Children of Alcoholics.* Ph.D. Dissertation, University of North Dakota, 1977. (Disseration Abstracts 39: B368, 1978.)

Baribeau, J., Braun, C., Bartolini G. and Ethier, M. Event-related potentials and selective attention in young males in relation to two risk factors for alcoholism: family history and drinking behavior. Paper presented at the *Eight International Conference on Event-Related Potentials of the Brain,* Stanford, CA, June 22-28, 1986.

Begleiter, H. Porjesz, B., Bihari, B. and Kissin, B. Event-related brain potentials in boys at risk for alcoholism. *Science* 225: 1493-1496, 1984.

Begleiter, H., Porjesz, B., Rawlings, R. and Eckardt, M. Auditory recovery function and P3 in boys at high risk for alcoholism. Paper presented at the *Eight International Conference on Event-Related Potentials of the Brain*, Stanford, CA, June 22-28, 1986.

Bell, R. and Cohen, R. The Bristol Social Adjustment Guide. comparison between the offspring of alcoholic and non-alcoholic mothers. *Brit. J. Clin. Psychol.* 20: 93-95, 1981.

Blouin, A.G., Bornstein, R.A. and Trites, R.L. Teenage alcohol use among hyperactive children; a five-year follow-up study. *J. Pediat. Psychol.* 3. 188-194, 1978.

Bosma, W.G. Children of alcoholics, a hidden tragedy. *Maryland State Med. J.* 21 (No. 1): 34-36, 1972.

Cantwell, D.P. Psychiatric illness in the families of hyperactive children. *Arch. Gen. Psychiat.* 27: 414-417, 1972.

Cloninger, C.R., Bohman, M. and Sigvardsson, S. Inheritance of alcohol abuse; cross-fostering analysis of adopted men. *Arch. Gen. Psychiat.* 38. 861-868, 1981.

Cotton, N.S. The familial incidence of alcoholism; a review. *J. Stud. Alc.* 40: 89-116, 1979.

de Obaldia, R., Parsons, O.A. and Yohman, R. Minimal brain dysfunction symptoms claimed by primary and secondary alcoholics, relation to cognitive functioning. *Int. J. Neurosci.* 20: 173-181, 1983.

Drejer, K., Theilgaard, A., Teasdale, T.W., Schulsinger, F. and Goodwin, D.W. A prospective study of young men at high risk for alcoholism. neuropsychological assessment. *Alcsm Clin. Exp. Res.,* N.Y. 9: 498-502, 1985.

el Guebaly, N. Risk research in affective disorders and alcoholism; epidemiological surveys and trait markers. *Canad. J. Psychiat.* 31: 352-361, 1986.

el Guebaly, N. and Offord, D.R. The offspring of alcoholics; a critical review. *Amer. J. Psychiat.* 134: 357-365, 1977.

el Guebaly, N. and Offord, D.R. On being the offspring of an alcoholic; an update. *Alcsm Clin. Exp. Res.,* N.Y. 3: 148-157, 1979.

Elmasian, R., Neville, H., Woods, D., Schuckit, M. and Bloom, F. Event-related brain potentials are different in individuals at high and low risk for developing alcoholism. *Proc. Nat. Acad. Sci.* 79: 7900-7903, 1982.

Ervin, C.S., Little, R.E., Streissguth, A.P. and Beck, D.E. Alcoholic fathering and its relation to child's intellectual development; a pilot investigation. *Alcsm Clin Exp. Res.*, N.Y. 8: 363-365, 1984.

Fillmore, K.M. *Historical Overview of Alcohol-Related Longitudinal Research.* Berkeley: Medical Research Group of San Francisco, 1985.

Gabrielli, W.F., Jr. and Mednick, S.A. Intellectual performance in children of alcoholics. *J. Nerv. Ment. Dis.* 171: 444-447, 1983.

Goodwin, D.W., Schulsinger, F., Hermansen, L., Guze, S.B. and Winokur, G. Alcohol problems in adoptees raised apart from alcoholic biologic parents. *Arch. Gen. Psychiat.* 28: 238-243, 1973.

Hegedus, A.M., Alterman, A. and Tarter, R.E. Learning achievement in sons of alcoholics. *Alcsm Clin. Exp. Res.*, N.Y. 8: 330-333, 1984.

Herjanic, B.M., Herjanic, M., Penick, E.C., Tomelleri, C. and Armbruster, R.B.S. Children of alcoholics. In: Seixas, F.A. (Ed.) *Currents in Alcoholism, Vol. II. Psychiatric, Psychological, Social and Epidemological Studies.* New York: Grune & Stratton, 1977, pp. 445-455.

Hughes, J.M. Adolescent children of alcoholic parents and the relationship of Alateen to the children. *J. Cons. Clin. Psychol.* 45: 946-947, 1977.

Jacob, T., Dunn, N.J. and Leonard, K. Patterns of alcohol abuse and family stability. *Alcsm Clin. Exp. Res.*, N.Y. 7: 382-385, 1983.

Kaij, L *Alcoholism in Twins: Studies on the Etiology and Sequels of Abuse of Alcohol.* Stockholm: Almqvist & Wiksell, 1960.

Knop, J., Teasdale, T.W., Schulsinger, F. and Goodwin, D.W. A prospective study of young men at high risk for alcoholism: school behavior and achievement. *J. Stud. Alc.* 46: 273-278, 1985.

McCord, W. and McCord, J. *Origins of Alcoholism.* Stanford: Stanford University Press, 1960.

McCord, W. and McCord, J. A longitudinal study of the personality of alcoholics. In: Pittman, D.J. and Snyder, C.R. (Eds.) *Society, Culture, and Drinking Patterns.* New York: Wiley, 1962, pp. 413-430.

Marcus, A.M. Academic achievement in elementary school children of alcoholic mothers. *J. Clin. Psychol.* 42: 372-376, 1986.

Martin, P.R. The human genetics of alcoholism. *Substance Alc. Act./Misuse* 2: 389-406, 1981.

Moos, R H. and Billings, A.G. Children of alcoholics during the recovery process: alcoholic and matched control families. Addict. Behav., Oxford 7: 155-163, 1982.

Morrison, J.R. and Stewart, M.A A family study of the hyperactive child syndrome. *Biol. Psychiat.* 3: 189-195, 1971.

Noll, R.B. and Zucker, R.A. Developmental findings from an alcoholic vulnerability study: the preschool years. Paper presented at the *Annual Meeting of the American Psychological Association,* Anaheim, CA, August, 1983.

O'Gorman, P. *Self-Concept, Locus of Control, and Perception of Fathers in Adolescents from Homes with and without Severe Drinking Problems.* Ph.D. Dissertation, Fordham University, 1975.

Poskitt, E.M. Foetal alcohol syndrome. *Alcohol Alcsm* 19: 159-165, 1984.

Prewitt, M.J., Spence, R. and Chaknis, M. Attribution of causality by children with alcoholic parents. *Int. J. Addict.* 16: 367-370, 1981.

Rolf, J.E., Johnson, J.R., Israel, E., Baldwin, J. and Chandra, A. Depressive affect in school-aged chidren of alcoholics. *British J. Addiction,* in press.

Russell, M., Henderson, C. and Blume, B. *Children of Alcoholics: A Review of the Literature.* New York: Children of Alcoholics Foundation, 1985.

Schaeffer, K.W., Parsons, O.A. and Yohman, J.R. Neuropsychological differences between male familial and nonfamilial alcoholics and nonalcoholics. *Alcsm Clin. Exp. Res.,* N.Y. 8: 347-351, 1984.

Schuckit, M.A. Genetics and the risk for alcoholism. *J. Amer. Med. Ass.* 254: 2614-2617, 1985.

Seligman, M.E. *Helplessness.* San Francisco: Freeman, 1975.

Steinglass, P. A life history model of the alcoholic family. *Fam. Process,* Balt. 19: 211-226, 1980.

Steinglass, P., Bennett, L.A., Wolin, S.J. and Reiss, D. *The Alcoholic Family.* New York: Basic Books, 1987.

Steinhausen, H.-C., Gobel, D. and Nestler, V. Psychopathology in the offspring of alcoholic parents. *J. Amer. Acad. Child. Psychiat.* 23: 465-471, 1984.

Streissguth, A.P. Alcohol and pregnancy. an overview and update. *Substance Alc. Act./Misuse* 4: 149-173, 1983.

Tarter, R.E. An analysis of cognitive deficits in chronic alcoholics. *J. Nerv. Ment. Dis.* 157: 138-147, 1973.

Tarter, R.E. and Edwards, K.L. Multifactorial etiology of neuropsychological impairment in alcoholics. *Alcsm Clin. Exp. Res.,* N.Y. 10: 128-135, 1986.

Tarter, R.E., Hegedus, A.M., Goldstein, G., Shelly, C. and Alterman, A.I. Adolescent sons of alcoholics. neuropsychological and personality characteristics. *Alcsm Clin. Exp. Res.,* N.Y. 8: 216-222, 1984.

Triplett, J.L. and Arneson, S.W. Children of alcoholic parents. a neglected issue. *J. Sch. Health* 48: 596-599, 1978.

U.S. National Institute on Alcohol Abuse and Alcoholism. *First Statistical Compendium on Alcohol and Health.* DHHS Publ. No. ADM 81-1115, Washington: U.S. Govt Print. Off., 1981.

U.S. National Institute on Alcohol Abuse and Alcoholism. *Alcoholism: An Inherited Disease.* DHHS Publ. No. 85-1426, Washington. U.S. Govt Print. Off., 1985.

U.S. National Institute on Drug Abuse. *National Household Survey on Drug Abuse: Population Estimates 1985.* DHHS Publ. No. 87-1539, Washington: U.S. Govt Print. Off., 1987.

U.S. Department of Transportation. *Fatal Accident Reporting System.* DOT No. HS-806-566, Washington: 1982.

Watt, N.F., Anthony, E.J., Wynne, L.C. and Rolf, J.E. (Eds.) *Children at Risk for Schizophrenia.* Cambridge: Cambridge University Press, 1984.

Werner, E.E. Resilient offspring of alcoholics: a longitudinal study from birth to age 18. *J. Stud. Alc.* 47. 34-40, 1986.

West, M.O. and Prinz, R.J Parental alcoholism and childhood psychopathology. *Psych. Bull.* 102 (No. 2): 204-218, 1987.

Wolin, S.J., Bennett, L.A. and Noonan, D.L. Family rituals and the recurrence of alcoholism over the generations. *Amer. J. Psychiat.* 136. 589-593, 1979.

ADDITIONAL RESOURCES

National Clearinghouse for Alcohol and Drug Information
P.O. Box 2345
Rockville, MD 20852

(301) 468-2600

The Clearinghouse is an information depository which has reading lists and booklets listing additional sources for information. Some of these are:

Deutsch, C., DiCicco, L. and Mills, D.J. Services for children of alcoholic parents. In: U.S. National Institute on Alcohol Abuse and Alcoholism. *Prevention, Intervention, and Treatment; Concerns and Models.* (Alcohol and Health Monograph No. 3.) DHHS Publ. No. (ADM) 82-1192. Washington, D.C.: U.S. Govt Print. Off., 1982.

U.S. National Institute on Alcohol Abuse and Alcoholism. *Services for Children of Alcoholics.* (Research Monograph No. 4.) DHHS Publ. No. (ADM) 82-1007. Washington, D.C.: U.S. Govt Print. Off., 1981.

U.S. National Institute on Alcohol Abuse and Alcoholism. *Biological/ Genetic Factors in Alcoholism,* edited by Hesselbrock, V.M., Shaskan, E.G. and Meyer, R.E. (Research Monograph No. 9.) DHHS Publ. No. (ADM) 83-1199. Washington, D.C.: U.S. Govt Print. Off., 1983.

Growing Concern: How to Provide Services for Children from Alcoholic Families. DHHS Publ. No. (ADM) 83-1257. Washington, D.C.: U.S. Govt Print. Off., 1983.

Several agencies also produce helpful information for the families of alcoholics:

Children of Alcoholics Foundation, Inc.
P.O. Box 4185
Grand Central Station
New York, NY 10163

National Association for Children of Alcoholics (NACoA)
31706 Coast Highway, Suite 201
South Laguna, CA 92677

National Council on Alcoholism, Inc. (NCA)
12 West 21st Street
New York, NY 10010

Al-Anon/Alateen Family Group Headquarters, Inc.
P.O. Box 182
Madison Square Station
New York, NY 10010

About the Center of Alcohol Studies

The Center of Alcohol Studies was founded at Yale University in 1940. The center has been a leader in the interdisciplinary research on alcohol use and its effects and has been in the forefront of the movement to recognize alcoholism as a major public health problem. Dr. E.M. Jellinek was the center's first director, and the prestigious *Journal of Studies on Alcohol,* still published by the center, was founded by Howard W. Haggard, M.D. In 1962, the Center of Alcohol Studies moved to Rutgers University.

The center's faculty have been trained in biochemistry, economics, physiology, psychology, psychiatry, sociology, political science, public health, education, statistics and information science. The faculty teach undergraduate, graduate and continuing education courses, including the world famous Summer School of Alcohol Studies. The SSAS alumni have assumed leadership positions in research, prevention and treatment of alcohol problems.

The center's major areas of concern are: research, education, treatment, prevention and information dissemination. As part of the center's educational mission, this pamphlet series presents information on important topics in the alcohol studies field.